

OSTEOPATHIC DIAGNOSIS

MEDICAL HISTORY:

Take a thorough medical history in order to gain an idea of where the fixations are in relation to the trauma suffered. This may not necessarily have been a serious trauma such as a traffic accident, a fall from a height, a sprain, a fracture etc but may be a postural, work-related microtrauma.

Assess the type of pain, its characteristics, when it increases or decreases and whether or not it has spread to another area of the body.

- Latency period
- Diagnosis of the etiology of the low back pain
- Appearance of pain
- Type
- Evaluation

DISC PAIN

- Pain increases when:
 - Gravity acts on the disc (sitting)
 - Flexing the trunk
 - Coughing, sneezing and defecating.
- With no latency period, the pain appears when weight is applied to the disc.
- Acute and can spread.
- Compression and decompression. If the disorder occurs in L5, Laségue +++.

LIGAMENT PAIN

Appears when remaining in one position for a prolonged period.

Appears at the end of the range of movement for active or passive movements.

Persists for between ten minutes and one hour.

Appears gradually.

Appears in the ligament when it is stretched and the position is held.

INTERAPOPHYSEAL CAPSULE:

- Facet joint closed: sidebending and ipsilateral rotation.
 - Appears when the facet joints shear.
 - Located on the closed facet joint.
 - Sidebending and rotation on the side on which the pain occurs.
- Facet joint open: sidebending and rotation on the opposite side to the opening.
 - Pain occurs on the open side.
 - Appears when the ligament and capsule apparatus is stretched.
 - Located on the open facet joint- pain can spread to the affected nerve.



- Sidebending and rotation on the opposite side to the pain.

ILIO LUMBAR LIGAMENT.

- When flexing the trunk and sidebending.
- When flexing the opposite side (differential diagnosis with disc disorders).
- Excluding the disc, the two remaining elements are the quadratus lumborum and the iliolumbar ligament.
- Persists for between ten minutes and one hour.
- Gradual.
- Flexion and sidebending on the opposite side.
- Pain on palpation of the area between the iliac crest and upper L4 and besides lower L5.

INTERSPINOUS LIGAMENT.

- When flexing the trunk, pain occurs on both sides.
- Straightening the spine also hurts.
- May be responsible for referred pain in the corresponding dermatome: cruralgia caused by the L3-L4 ligament.
- Persists for between ten minutes and one hour.
- Gradual.
- Flexing and maintaining the position as well as progressive straightening.

THE SACROILIAC LIGAMENT.

- Possible cause of hypomobility in the sacroiliac joint.
- When walking, going up or down stairs, any movement that requires mobility in the iliacus.
- May present referred pain in the S1 and S2 dermatome.
- Appears gradually.
- Rotation, ipsilateral sidebending and extension.
- "Sock" sign +++.
- Inability to complete a flexion, abduction or external rotation movement in the lower limb.

SACROSCIATIC LIGAMENTS.

- Appears when sitting.
- Persists for between ten minutes and one hour.
- Can cause local pain or pain in the S2 dermatome.
- Palpation of the ligament.

MUSCLE PAIN

Pain appears when completing an active movement or on the opposing action of a passive movement.



If the disorder is ischemic, repeated contraction will incur pain. If the disorder is tendonitis, the point of inflammation will hurt and is often spontaneous.

- Pain on movement: painful movement indicates that the muscle is damaged. Opposite movement that stretches the muscle causes a muscle REBOUND, caused by the spasm.
- Dull and diffuse pain, referred pain (TRAVELL).
- Ischemic pain that increases with sustained contractions.

Resisted movement.

NERVE PAIN

Pain appears with movement that stretches the affected nerve.

Accompanied by sensory, motor, hypoesthesia, paresthesias and hypotonia disorders.

It occurs immediately once the nerve is stretched.

Filiform- the patient indicates the path of the acute pain.

VISCERAL PAIN

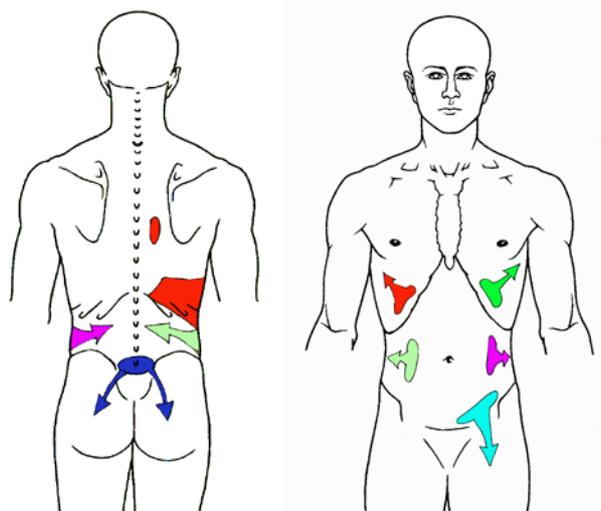
Referred pain in a determined area with no reduced joint mobility or muscle tension to justify the pain.

Appears or increases when the viscera is engaged.

Rhythmic pain (appears or increases when the affected viscera is engaged).

E.g. uterine low back pain.

Low back pain appears when flexing the trunk. The therapist completes a uterine lift. Palpate behind the pubic rami and perform an upwards traction of the uterus with the flexion movement. If the pain is visceral, it will disappear.



RADIOLOGICAL STUDIES

Radiology is a useful additional test to confirm the diagnosis formed from the medical history and the static and dynamic physical examination. It allows us to determine the bone and joint integrity as well as the vertebral static and dynamic (dynamic X-ray), areas of compensatory hypermobility and areas of fixation.

This type of study is widely used as it is readily available, quick and cost-effective.

The projections normally required are:

- Anteroposterior.
- Lateral thoracolumbar.
- Lateral with a small field.
- Centred on the lumbosacral segment.
- Oblique, fundamentally used for the study of facet joints and lysis that may be in the vertebral pedicle.

X-rays taken in flexion and extension (dynamic) allow us to observe instabilities and to detect a lack of harmony or breaks in the curves of the spine (signs of hypomobility). E.g. in an X-ray taken in flexion, the vertebra that rejects the movement will present a dysfunction in extension.

Ferguson projections are used to examine the sacroiliac joint and the L5-S1 disc.

Other types of radiological studies include: CT scans, MRIs and myelograms (which are no longer used as frequently as it is an invasive procedure that requires the patient to be hospitalized).

On a frontal projection, study the morphology of the vertebral bodies, the transverse processes, the spinous processes and the intervertebral spaces (except for the space between L5 and the sacrum).

Trace parallel, horizontal lines going through the superior border of the vertebral discs.

A dynamic projection in sidebending provides more information about the vertebra that rejects the movement on one of the two sides, indicating the presence of a dysfunction in sidebending on the other side.

If one of the vertebral bodies does not participate in the sidebending, it may be a sign of a disc protrusion.

On a lateral projection, the main thing we will see is the lumbosacral angle. Trace a vertical line going through the lumbar vertebral bodies and a perpendicular line to the base of the sacrum. This normally measures between 140° a 145°. This decreases in hyperlordosis and increases with corrections to the lumbar spine. Then trace one line going through the base of the sacrum and one horizontal line. This forms an angle of approximately 80°. The size of the angle will increase when the sacrum becomes more horizontal and will decrease when it becomes more vertical.

If you find a dysfunctioning segment that you presume to have a disc dysfunction, trace a horizontal line going through the upper disc of the vertebra directly below and a line going through the lower disc of the vertebra directly above. These lines



will cross at the posterior articular processes. On each of these lines, mark the posterior border of the vertebral body. As a result, you will be left with two distances A and B. If there is no problem with the disc, these distances will be equal. If there is a difference between them, e.g. A= 22mm and B= 26mm, this indicates anterior gliding of the vertebra directly below: spondylolisthesis.

If you want to measure the angle of the lordosis, trace a line parallel to the upper part of the L1 disc and a line parallel to the lower part of L5. Then trace a line perpendicular to each of those lines until they cross. These two lines will form an angle which will normally measure 45°.

On an oblique projection, the classic scotty dog image will appear, with the transverse process forming the nose.

- An oblique view of the pedicle forms the eye.
- The ear is the upper articular process.
- The front leg is the lower articular process.
- The lamina and the upper articular process on the other side form the tail.
- The lower articular process on the other side forms the back leg.
- The lamina forms the body.

Something to bear in mind is that the neck of the dog represents the vertebral isthmus (or the pars interarticularis). When this is broken, it leads to a diagnosis of spondylolisthesis- look for considerable gliding in the profile projection.

EXAMINATION

The patient should be examined while standing, sitting, walking and in different lying-down positions.

STANDING

- **Static:** observe the asymmetries, the height of the shoulders, the scapulae, the size of the triangles, the iliac crests, spinal curvature (hyperlordosis or correction) etc. (idem thoracic spine).
- **Dynamic**
 - For a dynamic examination, assess the quality and quantity of movements and whether they trigger pain.
 - Position of the therapist: standing behind the patient.
 - Position of the patient: standing. In this position, ask the patient to perform the different movements of the spine. If pain is triggered during:
 - A flexion movement: it is likely to be a dysfunction of the lumbar spine.
 - A rotation movement: it suggests a dysfunction of the thoracolumbar junction.
 - A sidebending movement: it indicates problems with the pelvis or disc hernias.
 - A sidebending movement with extension and ipsilateral rotation: it is likely to be a dysfunction in the rib on that side or a disc hernia.



DURING A FLEXION MOVEMENT:

The therapist should look for flat areas on the curve of the spine which would indicate areas of vertebral anteriority.

Also look for vertebrae with more prominent spinous processes as these would be in a state of flexion.



DURING AN EXTENSION MOVEMENT:

Assess the patient's ability to move and ability to extend the spine in general. This should increase the lordosis in the lumbar spine and correct the thoracic kyphosis.



DURING A SIDEBENDING MOVEMENT:

The therapist should also assess the harmony of the curve that is formed, identifying the presence of breaks that indicate areas of stress (hypermobilities), which will be painful on palpation.

The results of this dynamic examination are represented in a star-shaped diagram with 6 points that correspond to the 6 movements assessed. The length of each point of the star indicates the range of movement and pain is represented by small lines marked along the movement line (one line indicates little pain, two lines indicates some pain and three lines indicates significant pain). This methodology

produces clear and precise data on the patient's mobility, the level of pain they experience and any changes produced through treatment.



PALPATION

Mobility tests and static palpation enable us to identify both the dysfunctioning tissue and the dysfunction.

Carry out the appropriate orthopedic and neurological tests, according to the information found. Complete the evaluation using analytical osteopathic tests and analyze the dysfunctioning chains in order to select specific treatment.

An area of hypomobility, detected from a quick scanning and a vertebra in that area causing pain to the patient, detected through an analysis of the sclerotomes, suggest that the vertebra has a primary dysfunction, producing a facilitated segment of the spinal cord. To confirm this, evaluate the remaining elements of the dysfunction trio:

The dermatome, corresponding to the segment in question- assessed using the roll-pinching manoeuvre (looking for reflex dermalgias).

The myotome- assessed using muscle testing (looking for weaknesses in the muscles, in cases of hypotonic muscles) and palpation (assessing whether spasming muscles feel like myalgic cords).

NEUROLOGICAL EXAMINATION

Evaluate the affected nerve roots as follows:

- D12-L1-L2-L3: weakness when flexing the hip.
- L4: inability to walk on the heels. Reduced patellar reflex.
- L5: weakness when extending the big toe against resistance and when extending the gluteus muscles (extension of the hip).
- S1: inability to walk on the toes. Reduced achilles reflex.

As part of the neurological examination, complete the following provocation manoeuvres:

Produces an increase in the intradural pressure. Use the Valsalva Manoeuvre, which involves asking the patient to cough or apply force as if defecating. The manoeuvre is positive if the low back pain is reproduced.

Stretching of the nerve roots. Laségue Manoeuvre: with the patient in the supine position, raise the leg with the knee in extension. The test is positive if the sciatic pain is reproduced. To reinforce the manoeuvre, complete a dorsiflexion of the foot (Bragard).

Having studied the metameric elements, it will be evident which is the segment in dysfunction. The next step is to identify the vertebral lesion- establishing whether it is an NSR, FRS or ERS dysfunction.

MECHANICAL DIAGNOSTIC TESTS

QUICK SCANNING

- **Indications:** evaluative test, allowing us to rapidly detect areas of hypomobility. This test can be used for the sacroiliac joint, the lumbar, thoracic and cervical spine.
- **Patient:** sitting on the bed.
- **Osteopath:** behind the patient.
- **Action:** the osteopath fixes the patient's shoulders, either from behind or in front. Their other hand, in the shape of a fist, compresses the sacroiliac joint, the lumbar, thoracic and cervical spine posterior-anteriorly, assessing the elasticity of the tissue and the quality and quantity of movement (each way).



EXAMINING THE SCLEROTOMES ON THE SPINOUS PROCESSES

- **Indications:** major vertebral neurological dysfunctions (detect the segments with spinal cord facilitation).
- **Patient:** in the ventral decubitus position.
- **Osteopath:** beside the patient.
- **Action:** the osteopath palpates each of the spinous processes with a compression/ friction movement, identifying those that present pain.



EXAMINING THE SCLEROTOMES ON THE ARTICULAR PROCESSES

- **Indications:** major vertebral neurological dysfunctions. Detect the segments with spinal cord facilitation. Look for the posteriorities.
- **Patient:** in the ventral decubitus position.
- **Osteopath:** beside the patient.
- **Action:** the osteopath palpates the articular processes bilaterally with a compression/ friction movement, identifying those that present pain.



EXAMINING THE POSTERIORITIES - MITCHELL TEST

- **Indications:** somatic dysfunction in ERS/FRS/NSR.
- **Patient:** in prone position.
- **Osteopath:** beside the patient.
- **Action:** assess the patient in the three positions:
 - 1st position: Neutral prone position
Action: the osteopath palpates the transverse processes of the lumbar vertebrae bilaterally, observing any asymmetries, bearing in mind that the side of the posteriority indicates the side of the rotation of the vertebra. Bear in mind that several consecutive posteriorities may indicate the presence of a group lesion (in NSR). If, on the other hand there is only one posteriority, this suggests a unilateral lesion (ERS or FRS) but it does not indicate whether it is a

flexion or extension dysfunction, so it will be necessary to move to the second position.

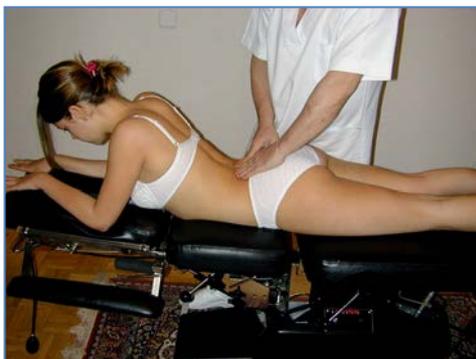


- **2nd position: Forwards bending**
With the patient in the ventral decubitus position, ask them to draw the trunk backwards until they are sitting on their heels with their head on the bed (global flexion of the spine) and with their arms stretched out on the bed. This is commonly referred to as the "Mahomet position."
Action: the osteopath, maintaining the contact made in the first position with the transverse processes, observes whether or not the global movement of the spine affects the asymmetry found (the posteriority). There are two possible outcomes: the posteriority could continue or it could disappear. If the posteriority disappears, it suggests that the vertebra has accepted the flexion movement created by the "Mahomet position"; if the posteriority continues, it suggests that the vertebra has not accepted the flexion movement.



- **3rd position: Sphinx position**
With the patient in the ventral decubitus position, ask them to support themselves on their elbows and complete an active extension to include the cervical spine. This position is usually described as the "sphinx position".
Action: the osteopath, maintaining the contact made in the first position with the transverse processes, observes whether or not the global movement of the spine affects the asymmetry found (the posteriority). There are two possible outcomes: the posteriority

could continue or it could disappear. If the posteriority disappears, it suggests that the vertebra has accepted the extension movement created by the "sphinx position"; if the posteriority continues, it suggests that the vertebra has not accepted the extension movement.



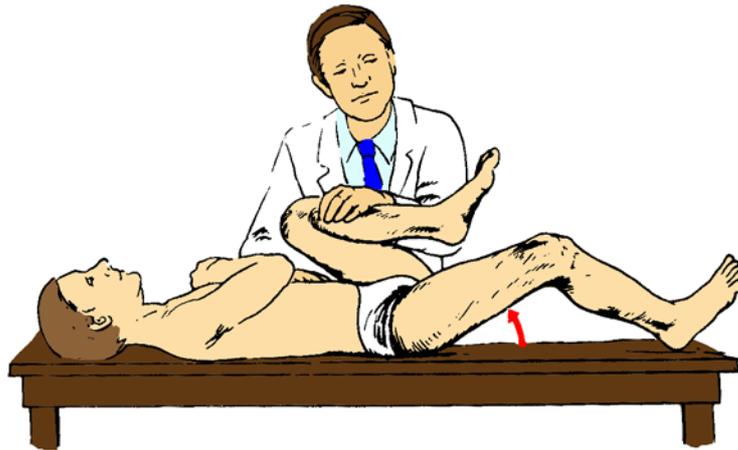
- **Interpreting the results of the test:**
 - If the posteriority disappears both in flexion and extension, it suggests that the vertebra is free, there is no restricted mobility.
 - If the posteriority disappears in flexion, but not extension, this suggests that it is a unilateral dysfunction that accepts the flexion but not the extension- an FRS dysfunction on the side of the posteriority (the posteriority indicates the side of the vertebral rotation).
 - If the posteriority disappears in extension, but not flexion, this suggests that it is a unilateral dysfunction that accepts the extension but not the flexion- an ERS dysfunction on the side of the posteriority (the posteriority indicates the side of the vertebral rotation).
 - If the posteriority does not disappear in flexion or extension, this suggests that the dysfunction is not in extension or flexion so it is an NSR on the side of the posteriority. In this last case, it is usually easy to find several posteriorities as they tend to be group lesions.

EXAMINING THE ILIOPSOAS

Thomas Test or Psoas Extensibility Test

- **Indications:** shortening of the iliac fascia or a spasm of the psoas muscle.
- **Patient:** in the supine position.
- **Osteopath:** on the opposite side to the muscle being evaluated.
- **Action:** The osteopath takes the lower limb on the opposite side to the side being evaluated, putting the knee and hip into maximum flexion until the knee makes contact with the patient's trunk (which reduces lumbar lordosis through the retroversion of the pelvis it produces) whilst observing what happens in the opposite hip.
- **Interpretation:**

- If the psoas muscle does not spasm: the opposite leg will remain stretched on the bed. In this case, test is negative.
- If the psoas muscle does spasm: the thigh on the side which is not being flexed will lift (as the lumbar lordosis reduces because of the retroversion of the pelvis, the distance between the origin and the insertion of the psoas muscle increases, making the hip flex, due to the loss of elasticity of the psoas muscle caused by the spasm).



The extension of the contraction in flexion can be examined by calculating the angle between the table and the patient's leg.

EXAMINING THE ILIOPSOAS 2

- **Indications:** psoas muscle spasms.
- **Patient:** in the supine position.
- **Osteopath:** standing, at the head of the patient. Take the patient's hands in yours.
- **Action:** lift the patient's arms backwards so that the backs of the patient's hands are facing each other, checking to see if the fingers reach the same point.
- **Interpretation:** the shorter arm indicates the side of the spasm in the psoas muscle. It transmits the shortening to the latissimus dorsi because of the sidebending of the lumbar vertebrae, caused by the spasm of the muscle.



REFERENCE:

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- Ricard F. Osteopathic treatment of the low back pain and sciatica caused by disc prolapse. Medos: Madrid. 2014.